



FILED

03/11/19
04:59 PM

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking Regarding Building
Decarbonization.

Rulemaking 19-01-011
(Filed January 31, 2019)

**OPENING COMMENTS OF THE
NATURAL RESOURCES DEFENSE COUNCIL (NRDC)
AND SIERRA CLUB**

March 11, 2019

Alison Seel
Sierra Club
2101 Webster Street, Suite 1300
Oakland, CA 94612
Tel: (415) 977-5753
Email: alison.seel@sierraclub.org

Matt Vespa
Earthjustice
50 California St., Suite 500
Tel: (415) 217-2123
Email: mvespa@earthjustice.org

On Behalf of Sierra Club

Merrian Borgeson
Pierre Delforge
Natural Resources Defense Council
111 Sutter Street, 21st Floor
San Francisco, CA 94104
Tel: 415-875-6100
Email: mborgeson@nrdc.org
pdelforge@nrdc.org

On Behalf of NRDC

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking Regarding Building
Decarbonization

Rulemaking 19-01-011
(Filed January 31, 2019)

**OPENING COMMENTS OF THE
NATURAL RESOURCES DEFENSE COUNCIL (NRDC)
AND SIERRA CLUB**

Pursuant to Rules 1.9 and 1.10 of the California Public Utility Commission’s (“Commission” or “CPUC”) Rules of Practice and Procedure, the Natural Resources Defense Council (NRDC) and the Sierra Club respectfully submit these comments on the *Order Instituting Rulemaking Regarding Building Decarbonization* (“Order” or “OIR”) issued February 8, 2019.

I. Introduction

NRDC and the Sierra Club appreciate the Commission’s initiation of this important rulemaking. Rapidly reducing greenhouse gas emissions from buildings is a critical component of achieving the state’s greenhouse gas reduction goals and addressing the climate crisis causing enormous personal, financial, and environmental losses across the state of California. Doing so in an equitable manner, e.g., by prioritizing incentives for low-income and disadvantaged communities, is also critical for meeting the state’s equity priorities and the principles outlined in the CPUC’s recently adopted Environmental and Social Justice Action Plan.¹

The commencement of this proceeding is also timely, as it comes on the heels of the California Energy Commission’s adoption of the most recent Integrated Energy Policy Report (IEPR) Update, which identified building decarbonization as the next clean energy policy priority for California to achieve its 2030 and 2050 climate goals.² The IEPR Update notes that

¹ California Public Utilities Commission. *Environment and Social Justice Action Plan*. (February 21, 2019), <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M263/K673/263673090.PDF>.

² California Energy Commission, *Final 2018 Integrated Energy Policy Report Update, Vol. II* (Jan. 28, 2019), https://www.energy.ca.gov/2018_energypolicy/documents/#02202019 (“2018 IEPR Update”).

the greenhouse gas emissions from buildings in California are second only to emissions from transportation.³ To address this problem, the IEPR makes a number of critical recommendations, including a focus on market development for high-performance clean space and water heating technologies, and encouraging electrification in buildings that can provide the grid flexibility needed for renewable power integration.⁴ The IEPR concludes that due to the availability of “off-the-shelf, highly efficient electric technologies (such as heat pumps) and the continued reduction of emission intensities in the electricity sector,” there is “a growing consensus that building electrification is the most viable and predictable path to zero-emission buildings.”⁵

Heat pump technology may not be the only technology supported by this effort (solar thermal, energy storage, demand management, advanced energy efficiency, and other technologies can also lower building emissions), but it will be important to jump start this nascent market in California. While commercialized and available in other parts of the world, heat pump technology is not yet widely available in California and contractors are not trained to install it. New buildings do not include heat pump technology as a standard practice today, and California policy has never before focused on this particular opportunity to reduce climate pollution. The Commission’s leadership in implementing SB 1477 will play an important role in addressing the building decarbonization recommendations identified in the IEPR Update.

We also support the Order’s focus on scalability and experimentation. The Commission should use initial SB 1477 funds to chart the path to significant reductions of building emissions over the long run. As the Order states, the initiatives created by SB 1477 “can be used to raise awareness of building decarbonization technologies and applications, test program and policy designs, and gain the practical implementation experience and knowledge necessary to develop a larger scale approach.”⁶ Given the broader work required, the Commission proposes four categories of issues to address building decarbonization: implementation of SB 1477 (Category 1), pilot programs for areas devastated by wildfires (Category 2), improving coordination with

³ *Id.*, p. 8.

⁴ *Id.*, pp. 47-49.

⁵ *Id.*, p. 20.

⁶ *Order Instituting Rulemaking Regarding Building Decarbonization* (“Order”), filed January 31, 2019, p. 10.

codes and standards developed by the California Energy Commission (Category 3), and creating a new policy framework for a comprehensive building decarbonization strategy (Category 4). NRDC and the Sierra Club support this set of four categories and look forward to engaging on each of them.

In these comments, NRDC and the Sierra Club discuss how the Commission's proposed guiding principles for a building decarbonization framework should be amended; offer specific recommendations for how to implement BUILD and TECH for long-term scalability, including program administration by the CEC and an independent third party, with high level guidance and criteria from the Commission that allows for implementation flexibility; highlight urgent modeling software issues that need to be addressed by the CEC to support BUILD implementation; recommend that the Commission clarify program eligibility for regulated and non-regulated fuel customers; and recommend that the Commission address urgent rate design issues in a parallel track of this proceeding.

We also offer for the record the following informational building decarbonization reports and studies:

- Attachment A: A Roadmap to Decarbonize California Buildings, Building Decarbonization Coalition (BDC)
- Attachment B: California's Building Decarbonization Opportunity: Knowing Where We Are and Delivering What We Need, BDC
- Attachment C: Rate Design for Beneficial Electrification, BDC
- Attachment D: Decarbonization of Heating Energy Use in California Buildings, Synapse Energy Economics

II. Comments on the Commission's Proposed Guiding Principles for Building Decarbonization Policy Development

NRDC and the Sierra Club largely support the proposed guiding principles but suggest a significant amendment to the first guiding principle and modest edits for clarity to several others. The Commission should also prioritize certain principles over others. They are not all equally important and in some limited cases may conflict with each other.

A. Revise First Guiding Principle to Focus on Emissions Reductions Required to Achieve 2045 Goals

The first guiding principle, intended to ensure fair competition between technologies, should do so by identifying the strategies that will most economically reduce greenhouse gas emissions in line with the statewide goal of achieving carbon neutrality by 2045. This revision is important for two reasons. First, it is important to have a principle that is explicitly focused on California’s long-term climate goals. Without this focus, the Commission risks making unproductive investments that may pass short-term emission reduction tests but cannot yield the necessary long-term emission reductions enabling the state to become carbon neutral by 2045. Short-term investments that lower greenhouse gases incrementally could inadvertently lock in infrastructure or equipment that is not consistent with the state’s long-term goals.

Second, we recommend clarifying the language proposed in the Order. “Technology and Vendor Neutral Competition” is most relevant at the onset of technology assessment and vendor competition, but ultimately the goal is to support the technologies and strategies that are needed to meet California’s climate goals. That will require choosing certain technologies or experienced vendors that best match pre-determined criteria needed to achieve greenhouse gas reductions at a reasonable cost. This may be different for each stage of this proceeding. There will be stages where market development requires understanding and influencing a *specific* market. Specific technologies, vendors, or strategies should not be favored at the outset, but it will be necessary to assess the potential and cost effectiveness of strategies for eliminating greenhouse gas emissions from buildings over the long-term, and in some cases, support should then be focused on the most viable or promising options.

For example, the Technology and Equipment for Clean Heating (TECH) program will focus on market development of clean space and water heating technologies. As part of this program, we anticipate that the program administrator will assess different technologies’ relative performance in meeting the program criteria, as defined in law and further developed by the Commission. Once that assessment is done and one or (more likely) several technologies are selected, the program will need to focus on market development specific to the selected technologies. Market development through the activities described in the law – such as upstream and midstream incentives and support, contractor and vendor training, and customer education – requires knowing *which* manufacturers, distributors, vendors, and contractors a program

administrator needs to engage, and what the specific market barriers are for that technology. By contrast, a program like the Building Initiative for Low-Emissions Development (BUILD) is more suited to allow builders to choose from a suite of technologies, as long as they significantly lower emissions in combination.

Given these concerns, we recommend revising the first principle to improve clarity and focus on the statewide climate goals (additions underlined, and deletions ~~struck through~~):

Principle 1: ~~Technology and Vendor Neutral Competition~~ Choose Emission Reduction Strategies Required to Achieve 2045 Carbon Neutrality in a Fair and Transparent Manner: The Commission should focus on the most promising and economic strategies to reduce building emissions in line with the statewide goal of achieving carbon neutrality by 2045 or sooner. The Commission should ~~avoid picking technology winners~~ consider the available strategies, and encourage competition among technologies, vendors, and approaches by using transparent criteria for evaluating alternative approaches based on their ability to produce scalable reductions in GHG emissions.

B. Prioritize and Clarify the Equity Principle

The Commission should put equity right after the focus on climate goals to emphasize that this effort prioritizes enabling every California resident to be part of the State's progress on climate. Doing so will also require the Commission to recognize and modify policy designs to accommodate existing income disparities that directly impact residents' ability to self-finance housing and building improvements without additional assistance. This focus is clear in the language of SB 1477 and should be highlighted in the Order as well. We suggest additional edits to this principle for clarity.

*Principle 2: **Equity:** Programs, ~~and~~ incentives, and policies should be targeted to benefit low-income California residents and those in disadvantaged communities, and designed to include and be accessible to all Californians in progress towards decarbonized buildings.*

C. Clarify the Need for a Long-Term Perspective for Market Transformation

The market transformation guiding principle should result in a long-term vision for building decarbonization programs, which will take time to achieve. The emphasis on self-sustaining market transformation should influence every aspect of implementation, from program design, to metrics, to evaluations. At every one of these stages, it will be important to

recognize that market transformation will take time to start delivering results at scale given the nascent market conditions today, but this approach will ensure that the resulting market adjustments are permanent and will not need to be subsidized indefinitely.

*Principle 3: **Market Transformation:*** The Commission should aim for developing self-sustaining markets practices where targeted technologies or approaches can ultimately operate in the general market without subsidies because supporting building decarbonization is now aligned with the profit motives of market actors. In the context of building decarbonization, market transformation should be viewed as the transformation and availability of both the technologies that decarbonize buildings and a skilled and trained workforce needed to install and service the technologies. Market transformation can take time to start delivering results at scale; therefore programs, metrics, and policies should be designed with this long-term perspective in mind.

D. Make Regulatory Simplicity and Transparency Guiding Principles Four and Five

NRDC and Sierra Club also support the principles of Regulatory Simplicity and Transparency articulated in the OIR. However, while they are applicable for most Commission activities, we suggest that principles 1-3 require the most attention within this proceeding, and therefore should be ordered and prioritized accordingly.

*Principle 4: **Regulatory Simplicity:*** All else being equal, the fewer and simpler the rules, the better. The easier it is for people to understand the rules, the easier it is for them to participate in Commission programs and respond to those rules in ways that benefit utility customers ratepayers and the public at large. This also makes Commission oversight easier.

*Principle 5: **Transparency:*** The Commission should strive to make its rules, policies, and procedures as transparent as possible. This applies both to how customers or vendors can access incentives, but also the conditions and circumstances under which vendors may be subject to citations and fines for bad behavior.

III. Answers to the Questions Asked in the Order

Question 1: Do you agree or disagree with the organization of the proceeding into the four proposed categories? Explain your reasoning.

With one exception (rate design), NRDC and Sierra Club agree with the organization of the issues within the proceeding into the four proposed categories. There will be connections

between these categories, so the Commission should not silo these categories entirely, but instead use them to organize the focus of discussions, workshops, and decisions within this proceeding. As an example of a connection, the TECH and BUILD programs can and should both be available in communities devastated by wildfires (though these communities may also need programs in addition to these). Another example is that coordination with the CEC's Title 24 building standards will be required to design the BUILD program.

The Commission's first priority should be to implement the BUILD and TECH programs, as these already have funding and parameters defined by law, and will serve to kick off building decarbonization activity in the state. Broader issues of inter-agency coordination and policy framework development can be taken up once these programs have been moved forward. Lessons learned through the implementation of SB 1477 will strengthen those later discussions.

In addition to the four proposed categories, NRDC and Sierra Club urge the Commission to consider rate design on a parallel track. As discussed in our response to Question 6 below, current rates are a barrier to strategic electrification, which must be addressed to ensure the broader success of building decarbonization.

We also offer some initial comments on the four categories:

Category 1: Implementation of SB 1477

NRDC and Sierra Club see the BUILD and TECH programs as the initial steps in California's building decarbonization efforts. As the Order recognizes, BUILD and TECH are valuable in part to test new program and policy designs, and gather the experience needed to develop a large-scale approach.⁷ The BUILD and TECH programs should be designed to inform the longer-term scalability of building decarbonization efforts.

Category 2: Potential Pilot Programs for Decarbonization of New Construction in Areas Damaged by Wildfires

We support the Commission's interest in using these building decarbonization programs to support rebuilding areas damaged by recent wildfires. The need in these communities goes beyond repairing or replacing buildings: wildfires have also damaged key infrastructure in these areas. Therefore, pilots should consider the most cost-effective ways to rebuild neighborhoods while avoiding investments in fossil fuel infrastructure that would lock in future GHG emissions

⁷ Order, pg. 10.

or create stranded assets. For example, pilots could offer customers on damaged segments of the gas system incentives to be used for efficient electric appliances, solar paired with storage, or to create a local microgrid to ensure reliability. This would reduce rebuilding costs and ensure that the rebuilding process is following the lowest-cost pathway to meeting the state’s long-term GHG emission goals.

Category 3: Coordinating with Title 24 Building Energy Efficiency Standards and Title 20 Appliance Standards

This is an important area of work, and there are many ways that the CPUC can coordinate with Title 24 and Title 20 Standards. We provide several specific recommendations:

- **Title 24 Building Standards Software Must be Updated to Avoid Limitations That Will Hinder BUILD Deployment in Multifamily Homes**

The BUILD program will likely rely on the Title 24 Building Standards’ compliance software CBECC-Res and CBECC-Com as the most practical way to evaluate GHG reductions from proposed new buildings, given that they are already used by builders to demonstrate code compliance and could easily be used to apply for BUILD incentives.

However, the draft 2019 Standards software presented by the CEC at its February 13 and 14, 2019 workshop lacks key features that if not implemented rapidly may hinder the design and implementation of the BUILD program in low-, mid- and high-rise multifamily buildings. This also jeopardizes the ability for BUILD to achieve the 30 percent minimum allocation to low-income housing.⁸ Missing features include the ability to model central heat pumps serving hot water loops for both domestic hot water and space heating, and an electric baseline that avoids the time-dependent-valuation (TDV) penalty when comparing electric designs to a gas system baseline. The independent electric baseline was added in CBECC-Res in the 2019 Standards but not yet in CBECC-Com.

The CPUC should coordinate with the CEC to ensure that these software limitations are resolved rapidly so that they don’t delay the design and deployment of the BUILD program to multifamily homes. Builders and developers will need the software improvements in order to determine whether to participate in the BUILD program and design houses that meet its

⁸ “NRDC comments on the Draft 2019 ACM Reference Manuals and Compliance Software Tools”, March 1, 2019, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=227226&DocumentContentId=58069>

requirements, it is therefore important that the improved software be available as soon as possible to enable early participation in the program.

- **Energy Efficiency Programs for New Homes (Advanced Single Family and Multifamily New Homes, CAHP and CMFNNH) Must be Updated to Enable Support for Efficient All-Electric Buildings**

The CPUC should quickly remove all disincentives for low-GHG solutions from energy efficiency new construction programs and ensure that incentives offered through these programs *encourage* the lowest GHG technologies and building practices. Currently, energy efficiency incentives for new construction are calculated according to the Energy Design Rating (EDR). EDR is based on the CEC's Time Dependent Valuation (TDV) metric, which does not consider GHG emissions and disadvantages all-electric new buildings. Recently, the CEC announced plans to replace TDV so that its metrics align with California's GHG goals by the 2022 code cycle.⁹ The first workshop to discuss a new metric is expected to be held in April 2019, with adoption in June 2019. The CPUC should engage in that process and consider updating all of its energy efficiency new construction and code readiness programs to use the new metric if it is shown to better enable building decarbonization.

- **The CPUC Can Support Title 20 Appliance Standards That Further Building Decarbonization**

CEC's ability to set mandatory appliance standards for heating appliances is limited by federal preemption law, but the CPUC and CEC can nonetheless support the development of performance specifications for standards for voluntary adoption. Voluntary standards, which are not subject to federal preemption, can help overcome adoption barriers and further reduce the overall cost of building decarbonization. For example, performance standards for demand management for building decarbonization technologies will help Californians manage their building equipment to reduce their costs as well as those of the power grid. The CEC is currently developing a demand management specification for heat pump water heaters;¹⁰ the CPUC should ensure that efficiency and building decarbonization investments in water heating technology are aligned with this specification.

⁹ 2018 IEPR Update, pp.47-48.

¹⁰ "NRDC comments on the Draft 2019 ACM Reference Manuals and Compliance Software Tools", March 1, 2019, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=227226&DocumentContentId=58069>

The CPUC can also ensure that the energy efficiency code readiness program supports demonstration projects and data collection that can later be used to influence federal appliance standards. Funding this work will be increasingly important in light of recent federal efforts to hamstring appliance standard development.¹¹

Category 4: Establishing a Building Decarbonization Policy Framework

NRDC and Sierra Club strongly support the “development of a coherent and comprehensive set of Commission rules, policies, and procedures to accelerate the reduction of GHG from buildings.” We suggest starting this phase of the proceeding in the fourth quarter of this year, after BUILD and TECH are launched. There are a range of issues that will need to be addressed in this part of the proceeding, including securing a sustainable source of funding to support building electrification, as was identified as a priority in the 2018 IEPR Update.¹² We strongly recommend that the Commission dedicate time, attention, and funding to building decarbonization solutions commensurate to their potential to decarbonize buildings in California.

Question 2: How should the Commission go about determining the administrative structure for the SB 1477 BUILD and TECH programs, from among the options listed in the statute?

The Commission should consider the requirements for successful implementation of each program, and make a decision based on these requirements. Each program should have a single administrator to ensure coherence across the state, but they do not need to be the same administrator (and likely they should not be the same administrator given the different requirements of each program). BUILD and TECH will be complimentary but have very different intervention points: BUILD involving the building and construction industry in the very early design stages of new construction projects; TECH aiming to transform the market for specific equipment for both new and existing buildings. Their administrative structures must reflect their different goals, audiences, and methods for creating change in the marketplace. Based on what we know today, and our position may change with more information, NRDC and

¹¹ US Department of Energy, *Energy Conservation Program for Appliance Standards: Proposed Procedures for Use in New or Revised Energy Conservation Standards and Test Procedures for Consumer Products and Commercial/Industrial Equipment*, February 13, 2019, Available at: <https://www.federalregister.gov/documents/2019/02/13/2019-01854/energy-conservation-program-for-appliance-standards-proposed-procedures-for-use-in-new-or-revised>

¹² 2018 IEPR Update, p.49.

Sierra Club recommend that the BUILD program be administered by the California Energy Commission (CEC) and that the TECH program be administered by an independent third party with market transformation expertise.

The CEC successfully implemented the New Solar Homes Partnership (NSHP) program, which provided incentives and technical assistance to home builders for the “construction of new, energy efficient solar homes that save homeowners money on their electric bills and protect the environment.”¹³ The NSHP goals – to work with the construction industry to encourage and reward deployment of distributed solar for new homes – were very similar to the goals for the BUILD program: to work with the construction industry to incentivize the deployment of technology to significantly reduce GHG emissions in new homes and apartments. The CEC’s decades of experience with building modeling and interfacing with the building community positioned it to successfully implement NSHP, preparing California’s construction industry to install distributed solar on every new home built starting in 2020. Now, with the additional experience of having implemented NSHP, the CEC is ideally positioned for administering the BUILD program. We recommend that the Commission select the CEC as the BUILD program administrator, along with the requirement that it bid out the technical assistance required to be provided to low-income housing developers to an entity with experience working with this market segment to ensure that the funds reserved for this group are fully and efficiently deployed.

The TECH program will involve a different set of stakeholders, centering on the space and water heating industry. The administrator of the TECH program will need expertise in the process of market transformation. They must be able to provide or flexibly contract with a range of service providers to deploy the right combination of engagement with manufacturers, distributors, and contractors, and possibly education to customers, to be effective. There are a number of organizations, both in California and in other jurisdictions, that run market transformation initiatives. Many of those organizations have developed valuable expertise on market transformation over decades of performing this work. Aligned with the Commission’s “market transformation” guiding principle for this proceeding, it would be appropriate for such

¹³ New Solar Homes Partnership (NSHP) program website:
<https://www.gosolarcalifornia.org/about/nshp.php>

an organization to administer the TECH program as a statewide third party, possibly with a team of subcontractors to provide the diverse combination of skills that will be needed for TECH.

Question 3: If the Commission chooses a third-party administrator, what process should it use to select the administrator?

NRDC and Sierra Club recommend that the Commission choose a third-party administrator for the TECH program via a competitive procurement process. As with the process used for the Solar on Multifamily Affordable Housing (SOMAH) program, an Investor Owned Utility (IOU) could manage the procurement process, but the bid review, selection, and award decisions should be made by Commission staff with the support of a procurement review group to ensure a fair process. The Energy Efficiency Procurement Review Group (PRG) has spent the last few months establishing protocols and templates that could easily be adapted for a solicitation of this nature, reducing the time and resources needed to stand a PRG up for this purpose.

Question 4: How should the Commission establish the budget for each program? What portion of the budget should be reserved for program evaluation? How should the program evaluator be selected?

NRDC and Sierra Club do not yet have a strong position on how the \$200 million in funding over four years should be divided between BUILD and TECH. We currently favor a 50/50 split, but we would prefer to comment on this issue once the programs are further developed.

The limited budget for the SB 1477 programs will also limit how much can be spent on evaluating the programs. Fortunately, program evaluation has evolved significantly in the last several years. Whenever possible, evaluation should be embedded in the design and implementation of the BUILD and TECH programs, and should focus on learnings that will be useful to inform policy and program design over the longer run (as opposed to a narrow accounting of GHG savings on the short-term).

Question 5: What program design parameters should be established by the Commission independent of the program administrator, and which aspects should it allow the selected program administrator to develop on behalf of the Commission?

Consistent with the proposed “regulatory simplicity” guiding principle, the Commission should limit the program design parameters it imposes on program administrators. The program

administrators should be allowed to apply their specialized expertise flexibly within guidance and criteria defined by the Commission. This will enable the programs to be responsive to their target audiences and encourage learning throughout the process.

In addition, we recommend that the Commission clarify who is eligible for these programs and that California residents using unregulated fuels (such as propane) be included; these homes have significant potential for reducing emissions cost effective and currently do not have access to incentives that would help them reduce the use of unregulated fuels. We also encourage the Commission to explicitly allow funding in the TECH program to be used for building infrastructure upgrades, such as service panel upgrades, for low-income residents.

NRDC and Sierra Club offer recommendations for each program on the items listed in the Order, and some additional recommendations relevant to each program that are based on the statute. We start with a table comparing the key elements of the two programs. We also provide feedback on the GHG calculation methodology, which will need to be developed.

Comparison of Program Elements

	BUILD	TECH
Program Goal	Incentivize the deployment of near-zero emissions technology to significantly reduce GHG emissions in new buildings	Provide statewide market development for low-emission space and water heating equipment
Building Sector	Residential new construction, single-family and multifamily	Residential new and existing, single-family and multifamily
Eligible Technologies	<ul style="list-style-type: none"> • Near-zero emissions technologies that significantly reduce direct and indirect GHG emissions. • Buildings can deploy a range of technologies that reduce projected GHG emissions. 	Low-emission space and water heating technologies that are in early stages of market development and have greatest potential to reduce GHG emissions.
Eligible Recipients	<ul style="list-style-type: none"> • Owners or developers of new residential housing 	<ul style="list-style-type: none"> • The residential space and water heating industry supply chain.
Eligible Interventions	<ul style="list-style-type: none"> • Direct financial incentives 	<ul style="list-style-type: none"> • Interventions can include upstream and midstream market development and incentives, contractor and vendor training, and consumer education.
Low-income and Hard to Reach Requirements	A minimum of 30 percent of funds reserved for low-income residences (as defined by SB 1477). Administrator required to provide technical assistance to engage this demographic.	<ul style="list-style-type: none"> • Outreach to hard-to-reach customers. • Special consideration given to technologies that "that improve the health and safety of, and energy affordability for, low-income households."

	BUILD	TECH
Other Requirements	Incentive amount shall take into account the availability of existing incentives and shall be based on the projected GHG reductions.	Program must be statewide.

BUILD Program Design Parameters That Should be Established by the Commission

Before responding to the provided parameters a-d from the Order, we suggest some additional guidance that the Commission should provide to program administrators:

- BUILD Emissions Baseline:** BUILD is intended to incentivize innovation in the building industry. As such, it should award incentives to builders who adopt innovative construction practices and/or install technologies that “significantly reduce” GHG emissions “below the minimum projected emissions reductions that would otherwise be expected to result from the implementation of the prescriptive standards” (§921.1.(a)(1)). The “minimum projected emissions reductions” required for new buildings under Title 24 are the projections based on using the mixed-fuel prescriptive compliance option. All other Title 24 compliance pathways result in lower emissions than the minimum allowed under the prescriptive mixed-fuel pathway. Therefore, per §921.1.(a)(1), BUILD incentives should be determined by using the Title 24 prescriptive mixed-fuel compliance option as a baseline for measuring incremental emission reductions.
- BUILD Incentives and Standards for Low-Income Buildings:** The environmental and health benefits of building decarbonization – including improved indoor and outdoor air quality and reduced risk of asthma and other pulmonary diseases – are most needed in California’s underserved communities. It will be important to effectively engage the low-income housing development community through the BUILD program. Incentives for new low-income housing must be higher than BUILD incentives for other buildings, as directed by law.¹⁴ The legislation also authorizes different program design options for low-income housing (as compared to market-rate housing): “incentives for buildings that serve low-income residents may have different standards from those that serve other

¹⁴ Order, pg. 11.

residents” (§921.1.(b)). In other words, SB 1477 allows for flexibility both in the way the incentives are structured, and the amounts offered. The Commission should direct the program administrator to use this flexibility to ensure that the minimum 30 percent allocation for low-income housing is deployed, and to work with low-income housing providers and advocates to identify what kinds of incentives will help them build low-emission buildings. Given the state’s housing affordability crisis, we also support allocating greater than the 30 percent minimum to low-income housing, and a percentage that is at least proportional to the representative low-income population in California. This will also be important to help low-income communities avoid the impacts of rising gas costs that can be expected with declining throughput and increasing infrastructure investments. The Commission should also direct the program administrator to ensure that low-income multifamily buildings are included in the program, and to work to resolve any issues with Title 24 modeling of multifamily buildings or other unique features of these buildings early on to ensure success.

- **BUILD Technical Assistance for Low-Income Buildings:** Per SB 1477, “technical assistance must be offered in conjunction with funding for projects directed at new low-income housing” (§ 921.1(d)(1)).¹⁵ Reaching and effectively influencing the low-income building industry will require focused outreach and diligent relationship management. Accordingly, the Commission should require the BUILD program administrator to contract with an organization with experience and existing relationships with low-income housing providers to provide this technical assistance. This contract should be awarded via a competitive solicitation.

a. BUILD - Technology eligibility criteria

The BUILD program is intended to encourage a range of innovative technologies and building practices that reduce GHG emissions significantly below a prescriptive baseline. Per the statute, the Commission can provide a list of eligible technologies, starting with the ones identified in SB 1477: heat pumps, solar thermal, advanced energy efficiency, and solar paired with energy storage (§921(e)(2)). However, because BUILD is focused on emission reductions

¹⁵ *Ibid*

below a baseline, potentially from a combination of technologies, it is most important that the Commission provide clear guidance to the program administrator to design the program with a GHG reduction levels that reflect long-term GHG climate goals and direct that incentives be based on those levels. This GHG threshold could be based on the trajectory of emissions reductions needed in new buildings today to help meet 2045 carbon neutrality goals, but it must have some flexibility as setting the “right” GHG savings incentive will require doing Title 24 modeling runs to understand the implications for builders and will require working closely with the building community to create a workable program.

NRDC and Sierra Club also encourage the Commission to direct the program administrator to set incentive levels so that they achieve maximum market transformation impact. This means identifying the incentive levels per type of building (single-family, low-rise / mid-rise / high-rise multifamily) that will reach the most builders in residential sectors where they may not otherwise have designed low-emissions buildings, setting the stage for maximum long-term market transformation in new construction.

b. BUILD - Process for evaluating technologies

The Commission should rely on the CEC to provide the process for evaluating new technologies as that is already what they do through the Title 24 development process. As new technologies are added to the Title 24 software, the GHG impacts of those technologies will be reflected in the building’s projected emissions.

c. BUILD - Guidelines and evaluation metrics

The Commission will need to define how the metrics required by law (number of low-emissions systems installed in each building type, projected utility bill savings, and the cost per metric ton of avoided GHG emissions) should be measured and reported. In addition, the Commission should direct the administrator to report on: learnings for future program design, the participation of buildings serving low-income residents, and impacts to the design practices in the building industry.

d. BUILD - Criteria for scoring and selecting projects

Once the Title 24 baseline is established, buildings will be automatically “scored and selected” by modeling the proposed building in the current software to assess the projected GHG emission reductions.

TECH Program Design Parameters That Should be Established by the Commission

a. TECH - Technology eligibility criteria

The Commission should provide eligibility criteria for the TECH program but should allow the program administrator to choose the technologies that best meet these criteria and to design the market intervention strategies. The TECH eligibility criteria should screen for the technologies that are most critical to enabling California's 2045 carbon goals and should be based on the language provided in SB 1477. The Commission should adopt criteria that include 1) long-term GHG reductions as compared to the most popular alternative in the market, 2) commercial readiness, 3) early market development (i.e., the product is not yet widely available, and/or the installation infrastructure is not developed) at least in the initial phase of the program given limited funds, 4) the size of the potential market and ease of installation in retrofit cases, and 5) whether the technology can provide health benefits or lower costs for low-income residents. The Commission should also require that the portfolio of technologies selected address both the single family and low/mid-rise multifamily markets (which represent the bulk of the multifamily building stock), and that at least some of the technologies are particularly applicable to serving low-income residents (e.g. technologies that could serve low-income multifamily buildings, or technologies that could most easily replace old, dirty, and dangerous gravity wall furnaces that are common in low-income rental housing).

b. TECH - Process for evaluating technologies

For TECH, the Commission should set the criteria as described in a. and the program administrator should evaluate and select technologies based on these criteria with feedback from a program advisory group.

c. TECH - Guidelines and evaluation metrics

The Commission will need to define how the metrics required by law (market share for eligible technologies, projected utility bill savings, and the cost per metric ton of avoided GHG emissions) should be measured and reported. In addition, the Commission should direct the administrator to report on: learnings for future program design, the engagement of the space and water heating industry, and participation of buildings serving low-income residents.

d. TECH - Criteria for scoring and selecting projects

Criteria for scoring and selecting projects is not required by SB 1477 for the TECH program. The Commission should allow the administrator to select technologies based on the

criteria provided by the Commission and enable the administrator to design a set of interventions tailored to advance the state’s market for space and water heating technologies.

Recommendation for the GHG calculation method

The Commission should collaborate with the CEC to identify a GHG calculation methodology that accounts for the long-term effects of load changes on an electricity mix with steadily declining carbon content. Due to the state’s legislative mandates for increasingly renewable electricity, the long-term effects of shifting load in California can be very different than the immediate effects. As is explained in Attachment B:

Turning electric load on or off today will likely immediately impact the amount of gas generation on the system, since gas plants are still used to “follow load” and balance the system second by second. However, if the electric load was removed or added permanently, the change would have long-term impacts on the electric system, more likely affecting long-term dispatch or procurement decisions, which would be subject to increasing renewable power requirements.¹⁶

In other words, the GHG reduction effects of installing controllable electric appliances will increase as time goes on. Given the Commission’s focus on long-term market transformation, it should select a GHG calculation methodology that accurately captures these “long-run build” effects.

The Commission should also ensure that GHG calculations include the impacts of methane leakage from all sources, from the well to the appliance. SB 1477 explicitly identifies the importance of counting both “direct and indirect emissions of greenhouse gases from buildings.”¹⁷ AB 2195 directed the Air Resources Board (CARB) to track GHG emissions from methane leakage of gas imported to California.¹⁸ The Commission should use those CARB numbers for out-of-state leakage and other best available data for on-site (behind the meter) leakage estimates.

¹⁶ Building Decarbonization Coalition, *California’s Building Decarbonization Opportunity: Knowing Where We Are and Delivering What We Need*, January 2019, pg.11.

¹⁷ S.B. 1477 (adding Pub. Util. Code Sec. 921(e)(B)).

¹⁸ A.B. 2195 (adding Health and Safety Code Sec. 39607(3)(A)).

Question 6: Should the Commission consider proposals for new rate designs as part of the design and implementation of the BUILD and TECH programs?

New electric rate designs will be key to making building decarbonization work for all Californians. Rates can be designed so that they reflect the cost of delivering power to a customer and in that way convey meaningful price signals that reward strategic electrification. However, the current rates available to most California utility customers discourage strategic electrification because they do not adequately reflect hourly or seasonal system costs. This means that customers with electric appliances are not rewarded with low rates when they run their appliances at times when system costs and emissions are lowest.¹⁹

In order to balance the importance of improving electric rates with the reality that rate design often involves lengthy regulatory processes, NRDC and Sierra Club recommend that this proceeding create a rate design track that is parallel to the SB 1477 implementation activities. The initial rate design discussions should direct the utilities to develop the studies and analyses needed to develop rates to support building decarbonization. That parallel track should also address several “quick fixes” to support building decarbonization:

- Allowing dual-fuel homes with electric water heating to qualify for the electric-baseline adjustment
- Removing the High Usage Charge penalty for grid-friendly electrification
- Removing the enrollment cap for SCE’s TOU-D PRIME rate for electrification technologies
- Adoption of rate similar to SCE TOU-D-PRIME by SDG&E and PG&E

After overcoming the most immediate rate design barriers for building decarbonization – baseline allowances, non-time-dependent high usage charges, and expanding access to existing rates – the proceeding can progress to issues of time-varying volumetric charges, solar compensation, and more advanced grid-harmonization rates. The BDC white paper *Rate Design*

¹⁹ SCE’s TOU-D-PRIME rate, by contrast, is an example of a TOU rate that incentivizes beneficial electrification. The rate features price differentials between peak and off-peak periods that are meaningful enough for customers to program equipment to use electricity when it is cheapest and cleanest. The cost-reflective volumetric rates during the off-peak periods are low enough to make the cleanest fuel (low-emissions electricity) cost competitive with the fossil fuel alternatives. TOU-D-PRIME aligns the costs that the customer sees with the costs of operating the grid *and* the underlying GHG emissions, thus helping reduce costs and emissions for all utility customers.

for Building Electrification in Attachment C discusses the issues affecting rate design needs at length.

Pursuing a parallel rate design track at the same time as the SB 1477 implementation category in this proceeding will allow the Commission to address the important rate design issues in a timely manner without delaying implementation of the legislative mandate.

Question 7: What goals should the Commission set for building decarbonization?

Rather than set goals based on what is possible within current market constraints, the Commission should set building decarbonization goals based on what the state needs to do to meet its long-term economy-wide climate goals: decarbonization of the building sector by no later than 2045.

The Commission should set goals linked to target dates to ensure building decarbonization is on track to meet the 2045 goal. Those interim goals should be informed by the normal replacement rate of building appliances. This will avoid having to retire appliances before they reach the end of their useful life. For example, space and water heating equipment lasts between 8 and 20 years. That means the least cost opportunity to replace appliances with zero-emission alternatives is only available every 8 to 20 years. The Building Decarbonization Coalition estimates that interim goals of 20% decarbonization of existing buildings by 2025 and 40% by 2030 make the most of those natural replacement rates.²⁰ The Commission should also consider the results of the CEC's analysis of options for reducing emissions from buildings 40 percent by 2030, as required by AB 3232, once that analysis is complete.

In addition, the Commission should establish goals that relate specifically to important priorities or known opportunities. We recommend that the Commission set goals for reaching low-income residents, such as a goal around the penetration of key building decarbonization opportunities in low-income housing and in disadvantaged communities. We also recommend that the Commission set a goal for new construction, given how much cheaper and easier it is to build a home right the first time, rather than retrofit it later. For example, the BDC recommends

²⁰ Building Decarbonization Coalition, *A Roadmap to Decarbonize California Buildings*, February 2019, p. 6.

that “zero emission building codes be adopted for the residential and commercial sectors by 2025 and 2028, respectively” to address the opportunity in new buildings.²¹

And finally, the Commission should set goals that are designed to address important barriers to decarbonizing buildings. The BDC provides five goals designed for this purpose, and we suggest these as a starting place:

- GOAL 1 - Customers, builders, contractors and policy-makers are aware of and demand building decarbonization measures.
- GOAL 2 - Customers receive a good value from adopting building decarbonization measures.
- GOAL 3 - Building decarbonization provides a better value to builders and contractors than fossil-fuel heating.
- GOAL 4 - Supply-chains and delivery agents are able to meet rising demand for carbon-free building technologies with a quality product.
- GOAL 5 - Policies are aligned to maximize customer awareness of and interest in building decarbonization, the customer, builder and contractor value proposition, and the industry’s ability to meet rising demand.²²

Question 8: What other specific initiatives should the Commission examine to further the goals outlined in the question above?

NRDC and Sierra Club offer two initiatives for consideration:

A. Removing Existing Policy Barriers to Support Building Decarbonization

Building decarbonization has the potential to be a very powerful tool for meeting California’s emission reduction goals, but this will require significant commitment and coordination of resources. Many of the public purpose programs already overseen by the Commission could be leveraged to enhance building decarbonization efforts. To facilitate these synergies, the Commission should work to remove existing barriers to leveraging other resources to support building decarbonization.

²¹ *Ibid*, p. 5.

²² *Ibid*, p. 9.

For example, notwithstanding the status of the three-prong test, energy efficiency funds could better support the adoption of advanced and highly-efficient heat pump technologies in existing all-electric homes, helping drive down the cost of the technology for other decarbonization uses. However, current energy efficiency rules require that all measures with no evaluated net-to-gross ratio (NTGR) and all measures with the same delivery channel for more than two years use an NTGR of 0.55.²³ This means that 45% of program participants are assumed to be free riders (even though the heat pump market is just getting started in California) and the incentives allowed for technologies such as heat pump water heaters are reduced by half or more. Building decarbonization potential will be hamstrung until this and all other similar barriers are removed.

B. Review of Gas Rules 15 and 16

The Commission should examine Gas Rules 15 and 16, which govern the extent to which costs of the extension of gas distribution mains are socialized across all utility customers and which provides allowances based on the number of installed gas appliances. Public Utilities Code Section 783 calls for the periodic review of the provisions of existing rules for the gas service extensions. To our knowledge, the Commission has not meaningfully revised the Gas Rules since first adopted in 1994 (D.94-12-026). As California works to decarbonize the building sector, it is now time for the Commission to review its gas line extension rules to determine whether modifications are needed to ensure they are designed in a manner that furthers state climate objectives and avoids investment in a potentially underutilized asset that could increase costs for utility customers.

IV. Conclusion

NRDC and Sierra Club appreciate the commitment to building decarbonization that the Commission demonstrated in the scope proposed in this Order. We support the direction of the proceeding as laid out in the Order and look forward to engaging on these topics.

²³ California Public Utilities Commission, DEER 2020, Residential NTGR Table, <http://deeresources.com/files/DEER2020/download/SupportTable-NTG2020-rev18Sep2018.xlsx>

Dated March 11, 2019

Respectfully submitted,

/s/ Alison Seel

Alison Seel
Sierra Club
2101 Webster Street, Suite 1300
Oakland, CA 94612
Tel: (415) 977-5753
Email: alison.seel@sierraclub.org

/s/ Matt Vespa

Matt Vespa
Earthjustice
On Behalf of Sierra Club
50 California St., Suite 500
Tel: (415) 217-2123
Email: mvespa@earthjustice.org

/s/ Merrian Borgeson

Merrian Borgeson
Natural Resources Defense Council
111 Sutter Street, 21st Floor
San Francisco, CA 94104
Tel: 415-875-6100
Email: mborgeson@nrdc.org

/s/ Pierre Delforge

Pierre Delforge
Natural Resources Defense Council
111 Sutter Street, 21st Floor
San Francisco, CA 94104
Tel: 415-875-6100
Email: pdelforge@nrdc.org